REMARKS/ARGUMENTS

Claims 1-20 were pending in this application and examined.

Claims 1, 13, and 17-19 have been amended. Claim 1-20 remain pending in this application after entry of this amendment.

THE CLAIMS

Rejections under 35 USC 103(a)

Claims 1-20 are rejected under 35 USC 103(a) as obvious in light of Stoneking et al. (USP 5,982,390) (hereinafter "Stoneking") in view of Even-Zohar (USP 6,738,065). Applicant respectfully traverses the rejections.

Claim 1

Claim 1 recites a method for simulating relative motion of objects in computer animation. Two objects are provided, namely, a "kinematic object" and at least one "dynamic object". As described in the specification of the application, a kinematic object is generally an object whose motion is specified by for example an animator. An example of a kinematic object is a superhero (as depicted in Figs. 1a and 1b of the application). A dynamic object is an object whose motion may be responsive to the kinematic object. An example of a dynamic object is the cape worn by the superhero in Figs. 1a and 1b. As recited in claim 1, the motion of the dynamic object is influenced by the motion of the kinematic object and the motion of the dynamic object is simulated using a physically-based numerical technique. As further recited in claim 1, the motion of the dynamic object is manipulated in response to the motion of the kinematic object when the motion of the kinematic object exceeds a predetermined threshold such that the motion of the dynamic object is influenced differently by the motion of the kinematic object when the motion of the kinematic object exceeds the predetermined threshold. Accordingly, the influence of the kinematic object on the dynamic object is different when the motion of the kinematic object exceeds the predetermined threshold and when it does not.

The manipulation of the motion of the dynamic object, as recited in claim 1, may be used to ensure desired motion for a dynamic object even when the motion of the kinematic object is unrealistic. For example, consider an animation of a superhero (the kinematic object) wearing a cape (the dynamic object). The motion of the cape may be modeled based upon the motion of the superhero. However, this modeling may achieve undesirable effects for the cape (as depicted in Fig. 1b and described in the application in paragraphs [0004] through [0008]) when the superhero performs exaggerated or unrealistic motion such as accelerating over 3Gs (3Gs may be set as the threshold). According to the invention recited in claim 1, the motion of the cape may be manipulated to achieve the desired motion. The motion of the cape may be manipulated such that motion of the cape is influenced differently by the motion of the superhero when the motion of the superhero exceeds the threshold (e.g., 3Gs).

Applicant submits that at least the above-discussed concepts recited in claim 1 are not made obvious by Stoneking or Even-Zohar, considered individually or in combination. Stoneking provides a control mechanism which ensures that an animated character in the form of a personality object maintains a consistent character, does not interact with other objects in undesirable ways, adheres to moral guidelines, and does not compete with itself across multiple licensing agreements (Stoneking: col. 5 lines 25-33; Abstract). Stoneking describes techniques for encapsulating the personality traits and behaviors of characters into digital objects that can be used in computer-assisted animation (Stoneking: col. 5 lines 44-52). Stoneking indicates that animation can be achieved by key frames, kinematics, or dynamic simulation, or by traditional animation techniques borrowed from the film industry, such as deformation (Stoneking: col. 3 lines 8-11)

Applicant submits that Stoneking is not concerned about simulating relative motion between two objects. Stoneking merely describes behaviors that can be associated with an animated character -- this is substantially different from simulating relative motion between two objects, as recited in claim 1. Unlike claim 1, Stoneking fails to teach a "kinematic object" and a "dynamic object" associated with the kinematic object and where the motion of the dynamic object is influenced by the motion of the kinematic object, and further where the motion of the dynamic object is manipulated when the motion of the kinematic objects exceeds a

threshold value (e.g., controlling the motion of the cape when the superhero accelerates upwards at non-realistic speeds).

Further, while Stoneking describes that animation can be achieved using kinematics or dynamic simulation, this does not teach anything about relative motion of objects and/or about manipulating motion of a dynamic object when the motion of a kinematic object exceeds a threshold, as recited in claim 1. The use of kinematics and dynamic simulation referenced in Stoneking for imparting motion to an animated is well known in the animation field. Claim 1 is however directed to relative motion between a kinematic object and a dynamic object and for manipulating the motion of the dynamic object when the motion of the kinematic objects exceeds a threshold value such that the motion of the dynamic object is influenced differently by the motion of the kinematic object when the motion of the kinematic object exceeds the predetermined threshold. Applicant submits that col. 3 lines 8-11 of Stoneking which merely refers to kinematics and dynamic simulation as animation techniques does not teach or even suggest such a concept recited in claim 1.

Accordingly, Applicant submits that claim 1 is not taught or suggested by Stoneking. Further, Applicant submits that the deficiencies of Stoneking are not cured by Even-Zohar.

Even-Zohar describes an animation system that utilizes custom blending of motion sequences in real-time. The blending uses motion sequences from motion capture libraries as a starting point and customizes the sequences for the desired effect. The Background section of Even-Zohar describes various animation techniques such as kinematics, inverse kinematics, motion capture using sensors attached to the body, keyframing, behavioral animation, and dynamics (Even-Zohar: col. 1 line 19 - col. 3 line16). The invention described in Even-Zohar uses inverse kinematics and forward dynamics for the blending. The concept of the blending is the capacity to predict the correct bio-mechanical behavior of the human body (Even-Zohar: col. 4 lines 11-18). Two sets of rules are used to achieve the result: (1) internal rules that refer to kinematic skeletal bio-mechnical conditions of bones, muscles, etc.; and (2) external rules that refer to environmental conditions such as gravity, objects, other dynamic forces, etc. (Even-Zohar: col. 4 lines 38-43). As described in Even-Zohar, the human body model may

comprise many parts (e.g., limbs, shoulders) whose motions can be altered independently. The blending tools can be used to marry individual sequences to produce smooth, lifelike movements, employing inverse kinematics (Even-Zohar: col. 7 lines 22-27; col. 12 lines 60-65). A user interface showing a blending palette that facilitates the blending is depicted in Figs. 3 and 4.

Accordingly, Even-Zohar describes techniques for blending different motion sequences to achieve smooth lifelike motion for the human body. Applicant however submits that Even-Zohar does not teach anything about a <u>predetermined threshold</u> and manipulating the motion of an object when the predetermined threshold is exceeded by the motion of another object. Unlike claim 1, Even-Zohar fails to teach manipulating the motion of a dynamic object when the motion of the kinematic object (which influences the motion of the dynamic object) exceeds a predetermined threshold such that the motion of the dynamic object is <u>influenced differently</u> by the motion of the kinematic object <u>when the motion of the kinematic object exceeds the predetermined threshold</u>. In light of the above, Applicant submits that at least the feature of manipulating the motion of the dynamic object, as recited in claim 1, is not taught or suggested by Even-Zohar.

Accordingly, even if Stoneking and Even-Zohar were combined as suggested by the Office Action (even though there appears to be no motivation for the combination), the resultant combination would not disclose the feature of manipulating the motion of a dynamic object when the motion of a kinematic object exceeds a threshold, as recited in claim 1. Applicant thus submits that claim 1 is patentable over a combination of Stoneking and Even-Zohar.

<u>Claims 2-20</u>

Applicant submits that independent claims 13, 17, 18, and 19 are allowable for at least a similar rationale as discussed above for the allowability of claim 1, and others. Applicant submits that dependent claims 2-12, 14-16, and 20 that depend from claims 1, 13, and 19, respectively, are allowable for at least a similar rationale as discussed above for the allowability

of claims 1, 13, and 19. Applicant submits that the dependent claims are also patentable for additional reasons.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

S. B. Kotwal

Sujit B. Kotwal
Reg. No. 43,336

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 650-326-2422
SBK:km
60541139 v1